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Corporate entrepreneurship and firm performance: a bridging contribution of green human resource management

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Abstract

Purpose – All organizations face significant challenges related to firm performance (FP), survival, and sustainability. This paper investigates the effect of corporate entrepreneurship (CE) on firm performance (FP) and green HRM (GHRM).

Design/methodology/approach – We applied the resource-based view (RBV) theory to underpin the theoretical framework. We employed a deductive approach and cross-sectional data collected through a questionnaire from firms' human resources directors and top executives of Egyptian manufacturing firms. This led to 308 valid samples from which to infer the results.

Findings – The structural equation model based on SmartPLS 4 results reveals a negative effect of risk-taking (RT) on FP and GHRM, while the impact of innovativeness (IV) and pro-activeness (PA) on FP and GHRM is positive. Moreover, GHRM is found to be a positive predictor of FP. Finally, mediation analysis shows that GHRM mediates the connection between IV, PA, and FP but not between RT and FP.

Practical implications – The study's findings could guide policymakers and small and medium- sized enterprises' (SMEs) authorities to focus more on CE and GHRM, which enhance the FP in manufacturing firms. The study's findings support the development and nurturing of an IV and PA culture to improve FP and productivity and bring sustainability to small enterprises. Finally, the study's conclusions enrich the depth of the literature by adding an empirical gesture from a developing context.

Originality/value – The study overcomes the gaps and offers a robust framework that integrates CE, GHRM, and FP with empirical evidence from Egyptian manufacturing firms.

Keywords Corporate entrepreneurship, Green HRM, Firm performance, Manufacturing firms, Emerging economies

Paper type Research article

1. Introduction

In typical organizational scenarios, the development of firm performance (FP) is a significant challenge for many organizations. FP points out the overall success and effectiveness of the

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organization, which can be achieved through setting strategic goals with full vision, maintenance of a competitive position, and efficient usage of resources (Ziyae and Sadeghi, 2020; Din *et al.*, 2023; Setyaningrum and Muafi, 2023). In the literature, FP is often assessed through both objective (e.g. profitability, market share, sales growth) and subjective indicators (e.g. managerial perceptions of success, stakeholder satisfaction). Despite numerous performance-enhancing strategies, the need to explore more integrative and strategic approaches remains critical.

One such approach is corporate entrepreneurship (CE), a firm-level strategic orientation that enhances innovativeness (IV), risk-taking (RT), and proactiveness (PA) within established organizations (Wiklund and Shepherd, 2005; Ziyae and Sadeghi, 2020). CE is conceptually distinct from strategic entrepreneurship, as it focuses primarily on internal innovation and renewal within existing firms. In contrast, strategic entrepreneurship often encompasses both internal and external entrepreneurial efforts, including alliances and market expansion. According to the literature, CE comprises three key dimensions: RT—the willingness to commit resources to uncertain outcomes; IV—the tendency to engage in and support new ideas, products, and processes; and PA—the ability to anticipate and act on future needs or changes in the environment (Schumpeter, 1936; Barringer and Bluedorn, 1999; Coccia, 2016; Orobia *et al.*, 2020).

In parallel, green human resource management (GHRM) has emerged as a strategic human resource practice that integrates environmental sustainability into organizational culture and behaviour (Dumont *et al.*, 2016; Jayabalan *et al.*, 2020). GHRM promotes eco-friendly values and practices by incorporating environmental goals into recruitment, training, performance management, and employee engagement. These practices help employees understand and align with the organization's sustainability objectives, thereby contributing not only to environmental performance but also to broader firm outcomes, such as innovation and operational efficiency (Islam *et al.*, 2021; Al Doghan *et al.*, 2022; Suleman *et al.*, 2024).

While past studies have investigated individual or dyadic relationships between CE, GHRM, and FP, integrative models that explore the combined influence of CE and GHRM on FP remain scarce. For instance, prior research has examined how innovative capacity or PA affects FP, or how global GHRM supports sustainable competitive advantage. However, little is known about how the three CE dimensions (RT, IV, PA) interact with GHRM practices to influence FP holistically, nor how GHRM may mediate the effects of CE on performance. Furthermore, much of this research is concentrated in Western or Asian contexts, leaving other scenarios (such as Egyptian manufacturing firms) underexplored (Shehata *et al.*, 2021).

To address these gaps, the present study proposes and empirically examines an integrated framework linking CE (via RT, IV, and PA), GHRM, and FP within the context of Egyptian manufacturing firms. Specifically, we raised the questions:

RQ1. How do CE dimensions (RT, IV, PA) affect GHRM and FP in Egyptian manufacturing firms?

RQ2. How does GHRM affect FP in Egyptian manufacturing firms?

RQ3. How does GHRM mediate the relationship between CE dimensions and FP?

The study explores CE's effect (via RT, IV and PA) on FP in Egyptian manufacturing firms. The study's findings assist policymakers and planners in enhancing FP by developing different strategies in terms of human resources management and corporate strategy. Moreover, the study findings enrich the depth of the domain literature by adding empirical evidence from a developing country context. The structure of the paper is, apart from this introduction section, a literature review and theoretical underpinning, hypotheses development, methods, analysis, discussion and conclusion, and finally, implications, limitations, and future research avenues.

2. Literature review and theoretical underpinning

2.1 Corporate entrepreneurship (CE)

CE is a firm level occurrence (Kaya, 2006), where individual entrepreneurship underlines a firm's orientation towards CE's three main dimensions: risk-taking (RT), innovative (IV), and proactiveness (PA) (Schumpeter, 1936, 1950; Barringer and Bluedorn, 1999). A firm is regarded as highly entrepreneurial when it consistently focuses on innovative actions, takes enormous risks, grabs opportunities, and performs before its rivals (Coccia, 2016). Orobia *et al.* (2020) suggested three main characteristics of CE such as RT, IV and PA.

2.1.1 Risk-taking (RT). RT underlines a firm's readiness to be involved in risky tasks (Liu *et al.*, 2002; Hamdan and Alheet, 2020) and is a significant element of strategic management (Ruefli *et al.*, 1999; Zhang *et al.*, 2024). In this sense, employees' RT is the most pertinent characteristic of CE (Zahra, 1993; Ziyae and Sadeghi, 2020). An RT mindset supports generating ideas and technological innovation within organizations (Baldegger *et al.*, 2020). With the support of RT and strategic HRM practices, organizations can enhance their green innovation and sustainable organizational performance (Correia *et al.*, 2024). RT also has a direct role in in enhancing FP (Shahzad *et al.*, 2019; Zhang and Aumeboonsuke, 2022), but how this role plays out varies from organization to organization and context to context (Dao and Phan, 2023; Korphaibool *et al.*, 2024). According to Florén *et al.* (2016), RT is pivotal for developing HRM practices, i.e. training and empowerment. RT is also a valuable construct in achieving sustainability goals and firms' long-term performance (Salehe *et al.*, 2024), where it nurtures innovation culture and HRM practices, ultimately leading to sustainable development (Al-Najjar *et al.*, 2024).

2.1.2 Innovativeness (IV). IV is a substantial element of CE, as it demonstrates a firm's willingness to sustain new ideas and introduce new products, processes, and organizational structures (Lumpkin and Dess, 1996; Coccia, 2016; Astrini *et al.*, 2020). In turn, this brings organizational creativity (Abd-elmonem *et al.*, 2022; Al-Najjar *et al.*, 2024). IV robustly promotes FP (Hurtado-Palomino *et al.*, 2024; Reyes-Gómez *et al.*, 2025). Firms can achieve significant performance boosts through IV, digital technology adoption, market information utilization, and strategic planning (Salomo *et al.*, 2008; Dibrell *et al.*, 2014; Shah *et al.*, 2024). Factors such as green culture, shared vision, and green creativity nurture the green IV, HRM, and environmental performance (Malik *et al.*, 2021; Fang *et al.*, 2022; Zhou *et al.*, 2024). In the study of Singh *et al.* (2020), GHRM and green transformational leadership positively enhance green IV. Likewise, in mining and small and medium-sized enterprises (SMEs), IV is predicted through GHRM practices, which leads to organizational success (Iqbal *et al.*, 2021; Suleman *et al.*, 2024).

2.1.3 Proactiveness (PA). PA underlines the process of the firms in two phases: foreseeing changes in the business environment and considering these variations and future wants (Bature *et al.*, 2018; Liu *et al.*, 2002). It refers to an organization's strategic behaviour, which enables it to consistently outperform competitors by identifying new market opportunities, taking swift and decisive actions on these opportunities, and implementing comprehensive and ambitious strategies (Birkinshaw *et al.*, 1998; Liu *et al.*, 2002; Dost and Umrani, 2024; Hurtado-Palomino *et al.*, 2024). The development of PA is possible through organizational capabilities, strong leadership, and innovation (Kreiser and Davis, 2010; Bature *et al.*, 2018; Schulze *et al.*, 2022; Kiss *et al.*, 2022). Within SMEs, proactive organizational cultures, green entrepreneurial orientation, and business operations are enhanced through GHRM practices, RT, IV, and green innovation (Hamdan and Alheet, 2020; Khan *et al.*, 2023). According to Patwary *et al.* (2023), proactive pro-environmental behaviours are boosted through green leadership, IV culture, and GHRM practices. Achieving robust sustainability and organizational performance is similarly possible through proactive environmental strategies and GHRM (Zhao *et al.*, 2020).

2.2 Green HRM (GHRM)

Green human resource management (GHRM) integrates environmental sustainability into HR practices to foster eco-friendly behaviours and attitudes within an organization (Dumont *et al.*,

2016; Jayabalan *et al.*, 2020). It includes training to stimulate environmental management as an essential organizational value, connecting eco-friendly behaviours to rewards and compensation, and considering the alignment between personal identity during recruitment and selection (Ngo and Ngo, 2023; Malik *et al.*, 2021). GHRM also ensures employees fully understand the organization's environmental policies and actively encourages them to deal with recommendations for environmental improvements, thus entrenching sustainability into the organizational culture (Islam *et al.*, 2021; Al Doghan *et al.*, 2022; Suleman *et al.*, 2024). Diverse constructs are substantial predictors of GHRM, such as RT, organizational culture, PA, organizational value, IV, effective policies, CE, entrepreneurial orientation, market information utilization, digital technology adoption, strategic planning, green culture, green creativity, shared vision, green leadership, proactive environmental strategies, among others (Salomo *et al.*, 2008; Dibrell *et al.*, 2014; Zhao *et al.*, 2020; Malik *et al.*, 2021; Fang *et al.*, 2022; Al Doghan *et al.*, 2022; Patwary *et al.*, 2023; Shah *et al.*, 2024; Suleman *et al.*, 2024; Zhou *et al.*, 2024).

2.3 Firm performance (FP)

FP underlines an organization's overall success and effectiveness in attaining its strategic goals, covering both financial and non-financial dimensions. There are diverse enablers of FP, i.e. market share and sales growth and return on sales and assets, that reflect a firm's ability to generate revenue, maintain a competitive position, and efficiently use resources (Barringer and Bluedorn, 1999; Wiklund and Shepherd, 2003; Kaya, 2006; Ziyae and Sadeghi, 2020; Din *et al.*, 2023). Furthermore, overall profitability, new product/service development capability, quality, and customer satisfaction are critical enablers of long-term success (Setyaningrum and Muafi, 2023). Employee job satisfaction is also vital, influencing productivity and organizational cohesion (Bature *et al.*, 2018; Çağlıyan *et al.*, 2022).

As a result, in the domain literature, diverse factors have been confirmed as significant predictors of GHRM and FP in the various organizations and contexts. These include RT, job satisfaction, capability, governance structures, PA, financial incentives, IV, strategic HRM, entrepreneurial orientation, technological advancement, internal capabilities, learning and emotional capacities, sustainable competitive advantage, green culture, green creativity, shared vision, green transformational leadership, organizational abilities, proactive environmental strategies, firm's environmental reputation, green product innovation and environmental commitment etc. (Akgün *et al.*, 2007; Chen and Ma, 2011; Zhao *et al.*, 2020; Baldegger *et al.*, 2020; Singh *et al.*, 2020; Malik *et al.*, 2021; Kiss *et al.*, 2022; Çağlıyan *et al.*, 2022; Fang *et al.*, 2022; Setyaningrum and Muafi, 2023; Mahmood *et al.*, 2023; Chau *et al.*, 2024; Al-Najjar *et al.*, 2024; Karim *et al.*, 2024; Zhou *et al.*, 2024).

However, the literature has notable gaps that need to be filled; for example, is missing an integrated framework that simultaneously integrates CE (RT, IV and PA), GHRM and FP. Moreover, the mediating contribution of GHRM in developing the connection between RT, IV and PA has still not been thoroughly investigated, and this exploration is still not sufficiently observed among manufacturing firms in Egypt in the domain literature.

Hence, based on these gaps (existing and contextual knowledge), we developed a theoretical framework where CE (RT, IV and PA) is proposed as the leading predictor of GHRM and FP. We also propose the mediating contribution of GHRM in reinforcing the connection between RT, IV PA and FP among the top executives and firms' human resources directors of Egyptian manufacturing firms (see Figure 1). As observed earlier, the theoretical reinforcement of this study is the resource-based view (RBV) (Fis and Cetindamar, 2009; Xianguo *et al.*, 2009; Dionysus and Arifin, 2020; Umrani *et al.*, 2022). We underpinned our framework with the resource view (RBV) theory, which has significance in predicting CE, FP, GHRM, and sustainability within firms (Hitt *et al.*, 2016; Xianguo *et al.*, 2009; Dionysus and Arifin, 2020), where it boosts firms' desire to differentiate themselves from rivals to improve sustainable competitive advantage and healthy performance (Fis and Cetindamar, 2009; Hitt

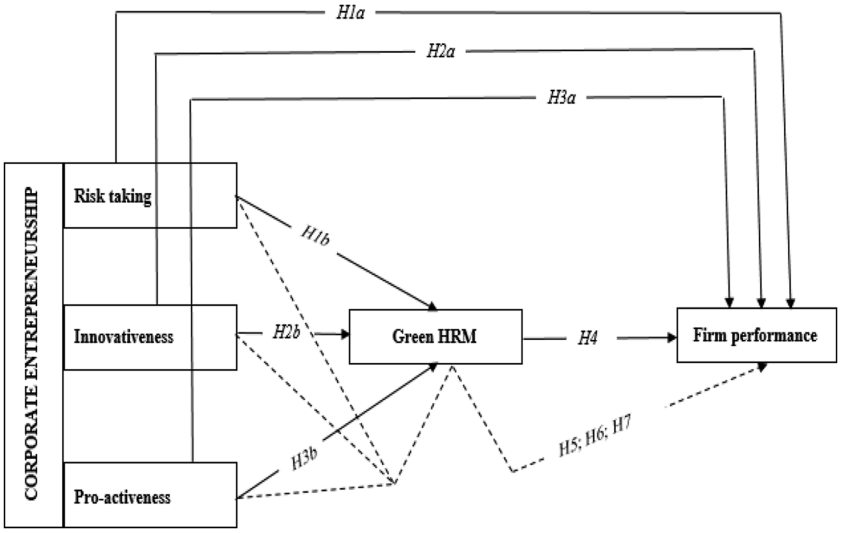

Figure 1. Theoretical framework of the study. Source: Developed by the researchers

et al., 2016; Umrani *et al.*, 2022). A firm enhances RT, IV, and PA to obtain a competitive advantage, which leads to robust FP (Castrogiovanni *et al.*, 2011; Umrani *et al.*, 2022; Dionysus and Arifin, 2020). The connection between CE and FP in light of RBV enhances the capabilities of resources to bring sustainable development within the firms (Fis and Cetindamar, 2009; Umrani *et al.*, 2018).

Factors such as CE dimensions and GHRM practices are connected to the principles of the RBV. Specifically, RT is supported by GHRM practices, i.e. green training and development, which encourage employees to experiment with environmentally responsible innovations despite uncertainties. IV is enhanced through recruitment and reward systems that prioritize creative problem-solving and environmental sustainability, enabling employees to develop innovative green processes and products. Likewise, PA aligns with performance management systems that promote anticipation of environmental trends and proactive engagement with green initiatives. These GHRM practices contribute to the development of human and organizational capabilities that are valuable (enhancing environmental and competitive performance), rare (as few firms adopt such integrated green-entrepreneurial HR strategies), inimitable (due to their path dependency and firm-specific learning), and non-substitutable (as no alternative resource can replicate the culture and competencies embedded in green-oriented CE behaviours).

While RBV provides a valuable lens for understanding how firm-specific resources and capabilities, i.e. GHRM practices, can lead to competitive advantage, it tends to emphasize resource stability and internal development. Nevertheless, there are several environmental challenges and uncertainties in terms of technological advancements, institutional gaps, and economic downturns in Egyptian manufacturing. As such, the static speculations of RBV may be insufficient because the model does not fully capture the importance of adaptability, learning, and responsiveness to external pressures. To address this, we acknowledge that RBV should be complemented with dynamic capabilities and institutional perspectives to reflect better how firms in emerging markets reconfigure and realign their resources in response to environmental shifts.

3. Hypotheses development

3.1 Corporate entrepreneurship (CE), firm performance (FP), and green HRM (GHRM)

CE, which consists of three main domains, RT, IV, and PA, is the best predictor of FP. More specifically, RT can directly influence FP, with both positive and negative effects, but it depends upon the contexts of the organization and the external environment (Gilley *et al.*, 2002; Shahzad *et al.*, 2019). This effect is frequently mediated or moderated by factors such as innovation (Zhang and Aumeboonsuke, 2022; Gibb and Haar, 2010), financial incentives (Chen and Ma, 2011), and governance structures (Karim *et al.*, 2024). The impact of RT also varies across different stages of a firm's lifecycle and depends on how the firm manages stakeholder relationships (Dao and Phan, 2023; Korphaibool *et al.*, 2024). Moreover, aligning RT with sustainability goals can enhance the long-term performance of the firms (Salehe *et al.*, 2024). In this domain, the argument of Florén *et al.* (2016) suggests the meaningful and constructive role of HRM practices, i.e. training and empowerment, in boosting entrepreneurial orientation, where RT plays a pivotal role. Hayton (2005) highlights that HRM practices promote creativity and autonomy for CE, with RT central to this process. An RT mindset is critical for implementing innovative technologies within HRM (Baldegger *et al.*, 2020). Specifically in the context of green HRM, Correia *et al.* (2024) establish that green HRM practices significantly impact sustainable performance by assimilating risk management into green innovation. Hence, through strategic HRM practices, RT can lead to heightened green innovation and sustainable organizational performance.

IV plays a crucial role in enhancing FP. Domain studies consistently show that firms with a strong orientation towards innovation, whether through strategic planning, market information utilization, or digital technology adoption, achieve superior performance (Salomo *et al.*, 2008; Dibrell *et al.*, 2014; Shah *et al.*, 2024). Internal capabilities, i.e. learning and emotional capacities, positively contribute to product IV, which leads to enhanced FP (Akgün *et al.*, 2007). Moreover, a supportive organizational culture and market orientation are critical for creating an environment conducive to innovation, further driving firm success (Deshpandé and Farley, 2004; Yousaf *et al.*, 2020). IV enhances immediate performance and contributes to sustainable competitive advantage, making it a critical factor in long-term competitiveness (Çağlıyan *et al.*, 2022). IV, along with other strategic orientations and capabilities, is essential for achieving and sustaining high levels of FP (Hurtado-Palomino *et al.*, 2024; Reyes-Gómez *et al.*, 2025). GHRM practices, i.e. green recruitment, training, and performance management, directly boost environmental IV by creating a culture that values sustainability and drives innovation (Ali *et al.*, 2021; Abd-elmonem *et al.*, 2022). Besides, the association between GHRM and IV is often mediated by factors such as green creativity, shared vision, and green culture, which strengthen the effect of GHRM on both green IV and environmental performance (Malik *et al.*, 2021; Fang *et al.*, 2022; Zhou *et al.*, 2024). Singh *et al.* (2020) demonstrate the significance of green transformational leadership in supporting GHRM's role in promoting green IV. In addition, GHRM is recognized as essential for translating corporate social responsibility (CSR) efforts into boosted environmental performance through green IV (Ngo and Ngo, 2023; Zhou *et al.*, 2024). This is significant in industries where sustainability is closely associated with competitive advantage, such as SMEs and the mining sector, where GHRM practices are most effective when these lead to IV (Iqbal *et al.*, 2021; Suleman *et al.*, 2024).

The association between PA and FP is well-established in the domain literature. More clearly, PA, as part of entrepreneurial orientation and CE, enables firms to anticipate market trends and act ahead of competitors, leading to enhanced innovation and performance outcomes (Kreiser and Davis, 2010; Schulze *et al.*, 2022). This PA is particularly effective when supported by strong leadership and organizational capabilities, strengthening its positive impact (Kiss *et al.*, 2022; Bature *et al.*, 2018). Besides, using strategic PA in form alliances and utilize information effectively further contributes to superior FP, especially in dynamic and resource-constrained environments (Yang and Meyer, 2019; Naseer *et al.*, 2021; Dost and Umrani, 2024). The connection between PA, IV, and other entrepreneurial traits accentuates its

importance in upholding a competitive edge and achieving long-term success (Haijian and Chuanming, 2009; Hurtado-Palomino *et al.*, 2024). PA and GHRM are closely interlinked, with PA driving the adoption and implementation of green practices within organizations. GHRM practices and green leadership create an environment in which employees are motivated to be involved in proactive pro-environmental behaviours (Patwary *et al.*, 2023). Proactive environmental strategies, supported by GHRM, improve a firm's environmental reputation and sustainability (Zhao *et al.*, 2020). Social entrepreneurs further reinforce this association by entrenching green values into organizational culture, which, moderated by social context, emboldens proactive green behaviour among employees (Bosompem *et al.*, 2024). Moreover, HR's role in managing organizational change highlights the standing of proactive GHRM in inserting sustainability into corporate transformations (El-Dirani *et al.*, 2019). A proactive green entrepreneurial orientation, strengthened by GHRM, also increases organizational resilience and drives green innovation (Khan *et al.*, 2023). Proactive organizational cultures within SMEs, supported by GHRM, lead to higher rates of IV and RT, demonstrating how sustainability becomes integral to business operations (Hamdan and Alheet, 2020).

Consequently, the domain literature underlines the positive link between CE (RT, IV and PA) and FP and GHRM. However, integrating all these constructs into one study still needs further confirmation, specifically in Egyptian manufacturing firms. Based on the theoretical background and prior empirical research, the following hypotheses are proposed:

H1a. Risk taking (RT) positively and significantly predicts FP.

H1b. Risk taking (RT) positively and significantly predicts GHRM.

H2a. Innovativeness (IV) positively and significantly predicts FP.

H2b. Innovativeness (IV) positively and significantly predicts GHRM.

H3a. Proactiveness (PA) positively and significantly predicts FP.

H3b. Proactiveness (PA) positively and significantly predicts GHRM.

3.2 Green HRM (GHRM) and firm performance (FP)

GHRM is a substantial predictor of FP because GHRM practices enhance organizational performance by boosting a culture of sustainability and operational efficiency (El Dessouky and Alquaiti, 2020). The association between GHRM and FP is often mediated by other factors, such as green product innovation and environmental commitment, which augment the impact of GHRM on business performance (Setyaningrum and Muafi, 2023). Also, GHRM practices and FP are positively connected through big data analytics (Mahmood *et al.*, 2023; Chau *et al.*, 2024). In both a retail context in Bahrain and ISO 14000-certified businesses in Thailand, GHRM practices have been shown to positively enhance FP (Jirawuttinunt and Limsuwan, 2019; Almeer and Almaamari, 2022). Moreover, GHRM enhances eco-innovation, which is critical for maximizing FP (Ansari *et al.*, 2022; Carballo-Penela *et al.*, 2023; Jayabalan *et al.*, 2020; Awwad Al-Shammari *et al.*, 2022; Altassan, 2024). Finally, employee commitment and individual values are indispensable in confirming the successful implementation of GHRM practices, which contributes to sustainable FP (Din *et al.*, 2023).

As a result, the linkages between GHRM and FP are deep-rooted, where GHRM is the best predictor of FP. However, in the presence of CE (RT, IV, and PA), these associations need further confirmation. Likewise, they have not been tested enough yet in Egyptian manufacturing firms. Based on the theoretical background and prior empirical research, we propose the following hypotheses:

H4. GHRM positively and significantly predicts FP.

3.3 Green HRM (GHRM) as mediator

GHRM is crucial in linking RT, IV, and PA with FP by aligning these behaviours with sustainability goals. For example, GHRM translates RT initiatives into environmentally responsible strategies, thus turning potential risks into sustainable opportunities to positively enhance FP (Úbeda-García *et al.*, 2021; Ahmed *et al.*, 2023). Similarly, GHRM reinforces a culture of IV aligned with sustainability, supporting market-relevant IV and ensuring these processes are environmentally friendly, eventually improving FP (Awan *et al.*, 2023; Singh *et al.*, 2020). In addition, GHRM underpins PA behaviours aimed at accomplishing long-term sustainability objectives, driving FP (Al Doghan *et al.*, 2022; Zhou *et al.*, 2024). Therefore, GHRM is a constructive link that ensures these vital organizational behaviours contribute positively to FP by entrenching them within the firm's environmental and sustainability framework (Islam *et al.*, 2021). Moreover, the domain literature also offers the consistent association between GHRM, RT, FP, IV, and PA (Kreiser and Davis, 2010; Dibrell *et al.*, 2014; Baldegger *et al.*, 2020; Singh *et al.*, 2020; Ali *et al.*, 2021; Iqbal *et al.*, 2021; Çağlıyan *et al.*, 2022; Ngo and Ngo, 2023; Correia *et al.*, 2024; Shah *et al.*, 2024; Hurtado-Palomino *et al.*, 2024; Bosompem *et al.*, 2024; Altassan, 2024; Zhou *et al.*, 2024; Reyes-Gómez *et al.*, 2025).

Consequently, based on the integrated need to confirm the mediating role of GHRM between RT, IV, PA, and FP, and to validate previous findings, we propose the following hypotheses:

H5. GHRM mediates the connection between RT and FP.

H6. GHRM mediates the connection between IV and FP.

H7. GHRM mediates the connection between PA and FP.

4. Methods

4.1 Sample

We applied a quantitative approach to collect cross-sectional data. Specifically, the choice of a cross-sectional approach aligns with the theoretical focus of the present study, which seeks to examine the existing relationships among several variables (e.g. FP, GHRM, IV, PA, and RT) at a single point in time rather than their evolution over time. From a theoretical perspective, RBV and related organizational theories emphasize the configuration of internal resources and capabilities as they currently exist rather than how they evolve. Therefore, a cross-sectional design is suitable for capturing a snapshot of organizational phenomena involving these constructs. Besides, the focus of this study helps in understanding the strength and direction of associations rather than making causal inferences, which would require longitudinal or experimental designs. As such, a cross-sectional design is not only methodologically justifiable but also theoretically congruent with the study's aim to examine whether specific constructs are aligned within organizations at a given point in time. On the other hand, longitudinal design can provide stronger insights into causality and the evolution of relationships over time (Rindfleisch *et al.*, 2008). Specifically, firms within Egypt's manufacturing sector frequently operate under resource limitations and, as a result, were only able to support a one-time data collection effort. This made longitudinal tracking unfeasible (Wright *et al.*, 2005). Furthermore, the primary objective of this study is to examine the associational relationships between CE, GHRM practices, and FP at a single point in time, which aligns with the assumptions of the RBV (Barney, 1991), focusing on the value of current internal resources and capabilities.

In the present study, as we employed a cross-sectional design, we acknowledge the potential for endogeneity concerns. The concerns (reverse causality, measurement error, and bias in the tested variable) could affect the validity of the estimated relationships. To mitigate these, we grounded our model in a well-established theoretical framework (e.g. RBV) to support the directionality of the hypothesized relationships. Additionally, we included relevant

control variables (e.g. firm size, age of firms, and position) to mitigate variable bias and employed validated multi-item scales to enhance measurement reliability.

In the previous studies, numerous scholars, such as Birkinshaw *et al.* (1998), Barringer and Bluedorn (1999), Liu *et al.* (2002), Wiklund and Shepherd (2003), Dumont *et al.* (2016), Singh *et al.* (2020), Malik *et al.* (2021), Kiss *et al.* (2022), Al-Najjar *et al.* (2024), Karim *et al.* (2024) and Zhou *et al.* (2024), applied the same technique to explore the same phenomena. We targeted top manufacturing companies in Cairo, Egypt. We started by collecting the total number of relevant companies, which is 456, as per information from "Glassdoor (2024)". These manufacturing companies include food and beverage, electronics, transportation equipment, consumer product, and machinery and others.

We collected the data from top executives and firms' human resources directors, who are responsible for the company's overall strategic direction and operational oversight (Mullins, 2018). The executives and directors ensure that the company meets its goals. This kind of collaboration is crucial to the long-term success and sustainability of an organization (Kelly and Gennard, 2007; Maxwell and Farquharson, 2008).

4.2 Survey tool confirmation

The quantitative approach can produce errors, which is a severe problem, predominantly in business, social science, and management research. In this study, the survey questionnaire was administered in English, we ensured its assumptions of reliability and validity through a pilot test; we collected 24 survey forms. With regard to reliability, we ensured consistency among the items using factor loading and Cronbach's alpha (Hair *et al.*, 2022). As a result, the loading values for most items was observed to be above 0.70 (>0.70), while a few items were appeared with the values of lower than 0.70 (<0.70).

Moreover, Cronbach's alpha reliability ensured all the satisfactory overall scores were 0.808, while all the constructs also seemed to be greater than the required values (>0.70) (Hair *et al.*, 2022). Specifically, we employed a structured face and content validity procedure, as recommended by Quick and Hall (2015). We engaged a panel of six experts, comprised of three academic scholars specializing in strategic management and sustainability and three industry professionals with over 10 years of experience in manufacturing and human resources management. We sent a complete set of surveys to these experts to ensure the items' relevance, clarity, and the association of these items with their respective factors. Apart from this, we also received feedback from the study respondents regarding the clarity of items and language barriers. After ensuring these aspects (reliability and validity) of the survey tools, we applied the survey for large scale data collection.

4.3 Data collection techniques

We applied the survey tool as the main tool for data collection. We employed two methods: online and offline data collection techniques. More specifically, we used an online survey to get feedback from study respondents, where we shared online links via WhatsApp groups and Facebook to contact most of the respondents to fill out the online survey. We also visited several Egyptian manufacturers using convenience sampling to reach the participants (Stratton, 2021). This method is simple, low-cost, and best practice for online and offline research (Emerson, 2015). It also allows for effective and practical searches on the internet. In this way, we initially distributed 550 surveys, where 310 cases were returned back in raw shape with a response rate of 56%. In cleaning and screening, we discarded two unsuitable cases and utilized 308 usable cases to conclude the study. To assess sample adequacy, we conducted a power analysis using G*Power for linear multiple regression with three predictors, which suggested the minimum required sample size is 77 (Faul *et al.*, 2009). In this manner, our sample size of 308 cases is sufficient to get the valid results with substantial statistical power. We also maintained the privacy and confidentiality of the respondents, who signed a consent form indicating their willingness to contribute to the study.

4.4 Measurements

We adopted all the items from the related literature for the questionnaire. More specifically, we assessed FP on nine items adopted from the studies of Wiklund and Shepherd (2003) and Barringer and Bluedorn (1999). GHRM was evaluated on five items, taken from the study of Dumont *et al.* (2016). We measured CE through its three core constructs, RT, IV, and PA, where RT, IV, and PA were measured with two, five, and three items, respectively. These items were adopted from the investigations of Birkinshaw *et al.* (1998) and Liu *et al.* (2002). We applied a five-point Likert scale based on options "strongly agree = 1 to strongly disagree = 5" (see Table 1).

Table 1. Questionnaire used in the study

Construct	Definition	Items details	Adopted from
Firm performance [FP]	FR underlines a company's effectiveness in achieving its strategic and operational goals through various financial and non-financial tools	FP1: Sales growth FP2: Market share growth FP3: Return on sales FP4: Return on assets FP5: Overall profitability FP6: Product/service quality FP7: New product/service development capability FP8: Job satisfaction of employees FP9: Customer satisfaction	Barringer and Bluedorn (1999), Wiklund and Shepherd (2003)
Green HRM [GHRM]	GHRM underlines the integration of environmental management into HR practices, such as training, rewards, recruitment, policy communication, and employee involvement. It aims to promote eco-friendly behaviour, align personal values with environmental goals, and encourage active participation in sustainability initiatives within the organization	GHRM1: My organization provides adequate training to promote environmental management as core organizational value GHRM2: My University relates employees' eco-friendly behaviour to rewards and compensation GHRM3: My organization considers personal identity-environmental management fit in recruitment and selection GHRM4: Employees fully understand the extent of corporate environmental policy GHRM5: My organization encourages employees to provide suggestions on environmental improvement	Dumont *et al.* (2016)
Risk-taking [RT]	RT refers to an organization's willingness to engage in actions or projects that involve higher levels of uncertainty or potential for loss compared to its competitors. This includes a greater propensity to pursue opportunities with higher risks and less aversion to projects with significant risks	RT1: Relative to our competitors, our organization has higher propensity to take risk RT2: Relative to our competitors, our organization is not averse to high-risk projects	Birkinshaw *et al.* (1998), Liu *et al.* (2002)

(*continued*)

Table 1. Continued

Construct	Definition	Items details	Adopted from
Innovativeness [IV]	IV underlines an organization's ability and willingness to apply new ideas, identify and respond to customer needs, and engage in strategic planning. It maintains a strong commitment to realizing its vision and often surpasses its competitors in these areas	IV1: Relative to our competitors, our organization is willing to apply new ideas IV2: Relative to our competitors, our organization has higher ability to identify customer needs and wants IV3: Relative to our competitors, our organization has higher level of innovation RV4: Relative to our competitors, our organization has higher ability to persevere in making our vision of the business a reality IV5: Relative to our competitors, our organization has a tendency to engage in strategic planning activities	Birkinshaw *et al.* (1998), Liu *et al.* (2002)
Pro-activeness [PA]	PA underlines an organization's ability to identify new opportunities earlier than competitors and to take early, comprehensive, and strategic actions to capitalize on them	PA1: Relative to our competitors, our organization has higher ability to identify new opportunities PA2: Relative to our competitors, our organization is effort to early action in each opportunity PA3: Relative to our competitors, our organization is effort to do comprehensive and pretentious strategic actions	Birkinshaw *et al.* (1998), Liu *et al.* (2002)

Source(s): Adopted from the literature

5. Analysis

5.1 Demography

The respondents' demographic characteristics showed a majority of male respondents (n = 218 or 70.78%) against females (n = 90 or 29.22%). Most respondents (n = 136 or 44.15%) were 26–35 years of age, while a minority of respondents (n = 18 or 5.85%) were more than 50 years of age. A majority of respondents (61.69% or n = 190) were top executives, while 38.31% (n = 118) were HR directors. Moreover, the firm size indicator suggests a majority (n = 142 or 46.10%) were medium-sized firms, while only 22.08% (n = 68) were large-scale firms. The ownership status of the firms demonstrates a majority of firms as family firms (n = 166 or 53.90%) against other firms (n = 142 or 46.10%). Finally, a majority of firms (n = 188 or 61.04%) were more than 15 years old, while only 7.47% (n = 23) were less than 5 years old (Table 2).

5.2 Measurement model

We used SmartPLS 4.0 as the primary instrument to conduct the measurement and structural model (Ringle *et al.*, 2015). Partial least squares structural equation modeling (PLS-SEM) was selected for this study due to its suitability for complex models, predictive purposes, and its ability to handle non-normal data distributions and relatively small sample sizes (Hair *et al.*,

Table 2. Demographic characteristics of the respondents (n = 308)

Constructs	Category	Frequency and percentage
Gender	Male	218(70.78)
	Female	90(29.22)
Age	18–25	48(15.58)
	26–35	136(44.15)
	36–50	106(34.42)
	51+	18(5.85)
Position	Top executive	190(61.69)
	HR director	118(38.31)
Firm size	Small [<50]	98(31.82)
	Medium [50–250]	142(46.10)
	Large [>250]	68(22.08)
Ownership status of firms	Family firms	166(53.90)
	Other firms	142(46.10)
Age of firms (years)	<5	23(7.47)
	6–15	97(31.49)
	>15	188(61.04)

Source(s): Researchers' own survey

2022). PLS also serves as the most appropriate option to confirm causal prediction rather than theory testing (Hair *et al.*, 2022; Sarstedt *et al.*, 2016). We proceeded with the measurement model in two stages. In the first stage, we confirmed common method bias to investigate the issue of full collinearity following the recommendations of Kock and Lynn (2012) and Kock (2015), which state that the Variation Inflation Factor (VIF) must be less than 3.3 (≤3.3). In this study, the results offered a VIF of less than 3.3, which indicated no concern of single source bias with the data. Moreover, we ensured loadings, the average variance extracted (AVE) and composite reliability (CR) to calculate the measurement model. Hair *et al.* (2022) strongly recommended that the loadings and CR values should be larger than 0.70 (>0.70), and AVE values should be greater than 0.50 (>0.50). In this study, the loading (except GHRM5) CR, and AVE values appeared to be within acceptable ranges (Table 3 and Figure 2). We also ensured the internal consistency among items through Cronbach's alpha and found it to be in a fair range (>0.70) (Hair *et al.*, 2022).

In the second stage, we examined the discriminant validity using the heterotrait-monotrait (HTMT) criterion, as modified by Franke and Sarstedt (2019), and proposed by Henseler *et al.* (2015). The stricter threshold for HTMT scores must be ≤ 0.85, although the mode lenient criterion should be ≤ 0.90. In the present study's analysis, all HTMT values were found to be lower than the stricter criterion of ≤0.85 (Table 4). Therefore, we ensured that the respondents understood the differences between these five constructs. This satisfied discriminant validity.

5.3 Structural model

In the measurement model, we employed a mixture of criteria, such as *p*-values, confidence levels, and effect sizes. We did so in response to Hahn and Ang's (2017) critique, who argue that *p*-values are not a worthy criterion for evaluating the significance of hypotheses. In this vein, Hair *et al.* (2022) suggested that the best approach is to use a 10,000-sample re-sample bootstrapping approach to ensure the path coefficients, t-values, standard errors, and *p*-values.

The overall coefficient of determination (R^2) value recorded 0.806, comprising RT, IV, PA, and GHRM. Similarly, 0.537 was observed with a combination of RT, IV, and PA constructs. These scores suggest a high level of contribution of R^2 with 80% and 53%, respectively (Hair *et al.*, 2022). The R^2 value of 0.800 for the first model indicates that 80% of the variance in the dependent variable is explained by the combined effect of the independent variables, reflecting substantial

Table 3. Measurement model

Construct	Item	Loading	VIF	CR	AVE	Alpha (α)
Firm performance [FP]	FP1	0.846	3.903	0.939	0.634	0.929
	FP2	0.874	4.204			
	FP3	0.879	4.877			
	FP4	0.783	2.631			
	FP5	0.776	3.219			
	FP6	0.732	4.824			
	FP7	0.762	3.863			
	FP8	0.725	4.599			
	FP9	0.772	3.945			
Green HRM [GHRM]	GHRM1	0.935	4.918	0.953	0.835	0.933
	GHRM2	0.937	4.639			
	GHRM3	0.926	4.277			
	GHRM4	0.852	2.330			
Innovativeness [IV]	IV1	0.830	2.387	0.943	0.767	0.924
	IV2	0.916	4.162			
	IV3	0.887	3.729			
	IV4	0.893	4.199			
	IV5	0.849	3.029			
Pro-activeness [PA]	PA1	0.944	4.178	0.953	0.870	0.925
	PA2	0.909	2.879			
	PA3	0.946	4.521			
Risk-taking [RT]	RT1	0.952	2.748	0.947	0.899	0.887
	RT2	0.944	2.748			

Note(s): Deleted item: GHRM5
Source(s): Estimated by the researchers

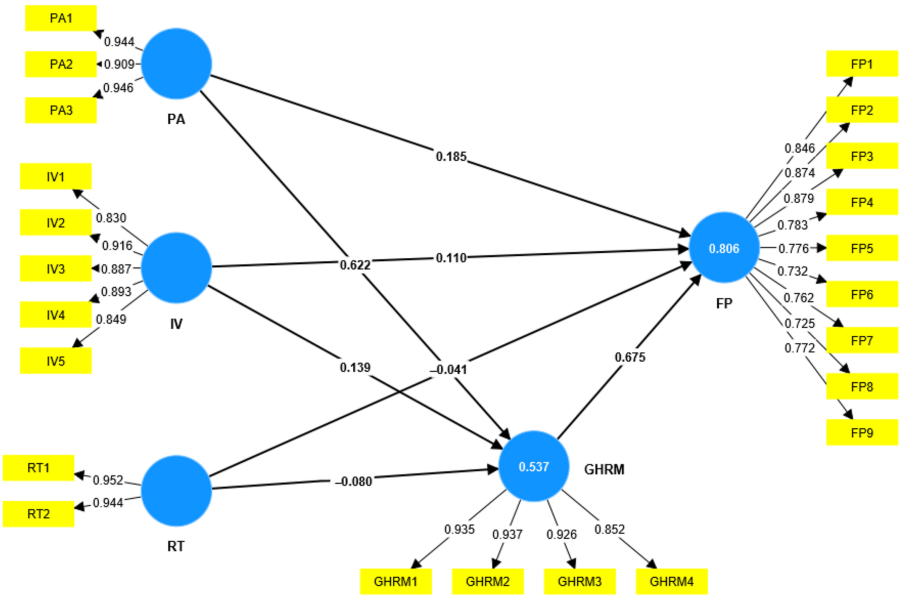

Figure 2. Measurement model. Source: Estimated by the researchers

Table 4. Heterotrait-monotrait ratio (HTMT)

Constructs	1. FP	2. GHRM	3. IV	4. PA	5. RT
1. FP					
2. GHRM	0.611				
3. IV	0.653	0.606			
4. PA	0.784	0.772	0.735		
5. RT	0.149	0.128	0.077	0.049	

Note(s): FP = firm performance; GHRM = green HRM; IV = innovativeness; PA = pro-activeness; RT = risk-taking

Source(s): Estimated by the researchers

explanatory power (Hair *et al.*, 2022). Likewise, the R^2 value of 0.537 in the second model indicates a moderate to significant level of explained variance. According to Chin (1998), R^2 values of 0.67, 0.33, and 0.19 can be classified as substantial, moderate, and weak, respectively. Therefore, the values reported in this study reflect strong model fit and predictive relevance. When compared to similar studies in the context of performance and CE outcomes, such as Xie *et al.* (2021), who reported R^2 values ranging from 0.40 to 0.60, our results demonstrate a comparable or even higher explanatory power. This suggests that the selected constructs (RT, IV, and PA) are highly relevant predictors in the context of Egyptian manufacturing firms and contribute meaningfully to explaining firm performance and GHRM outcomes.

As a result, our model possessed satisfactory explanatory power. As presented in Table 5 and Figure 3, the direct path coefficient suggests a negative effect of RT on FP and GHRM [(H1a = β = −0.041; $p > 0.05$), (H1b = β = −0.080; $p > 0.05$)] which rejects H1a-H1b. The study confirmed the positive effect of IV and PA on FP and GHRM [(H2a = β = 0.110; $p < 0.05$), (H2b = β = 0.139; $p < 0.05$), (H3a = β = 0.185; $p < 0.05$), (H3b = β = 0.622; $p < 0.05$)]. Hence, H2a, H2b, H3a, and H3b are supported. Finally, there is a positive effect of GHRM on FP (H4 = β = 0.675; $p < 0.05$), meaning H4 is also reinforced by the data.

Regarding indirect effects, the path coefficient does not support H5 as GHRM does not mediate the connection between RT and FP (H5 = -β = 0.054; $p > 0.05$). On the other hand, the study confirms the mediating effect of GHRM in bridging the connection between IV and FP, and PA and FP [(H6 = β = 0.094; $p < 0.05$), (H7 = β = 0.420; $p < 0.05$)]. As such, H6-H7 are accepted (Table 6).

Table 5. SEM estimations [direct paths]

H.No.	Proposed paths	Std. (β)	Mean	Std. Dev	*t*-value	*p*-value	BCI LL	BCI UL	f^2	Supported
H1a	RT→ FP	−0.041	−0.042	0.029	1.428	0.153	−0.098	0.015	0.0103	No
H1b	RT→ GHRM	−0.080	−0.081	0.046	1.761	0.078	−0.173	0.007	0.0151	No
H2a	IV → FP	0.110	0.110	0.040	2.733	0.006	0.032	0.188	0.0309	Yes
H2b	IV → GHRM	0.139	0.140	0.063	2.198	0.028	0.017	0.265	0.0238	Yes
H3a	PA→ FP	0.185	0.184	0.055	3.396	0.001	0.077	0.289	0.0619	Yes
H3b	PA→ GHRM	0.622	0.622	0.064	9.784	0.000	0.495	0.743	0.4449	Yes
H4	GHRM → FP	0.675	0.677	0.060	11.294	0.000	0.561	0.791	1.0979	Yes

Note(s): Effect size = F2 [none = 00; small = 0.02; medium = 0.15; large = 0.35]; $p < 0.5$; BCI LL = the bias-corrected confidence interval lower limit; BCI UL = the bias-corrected confidence interval of upper limit

Source(s): Calculated by the researchers

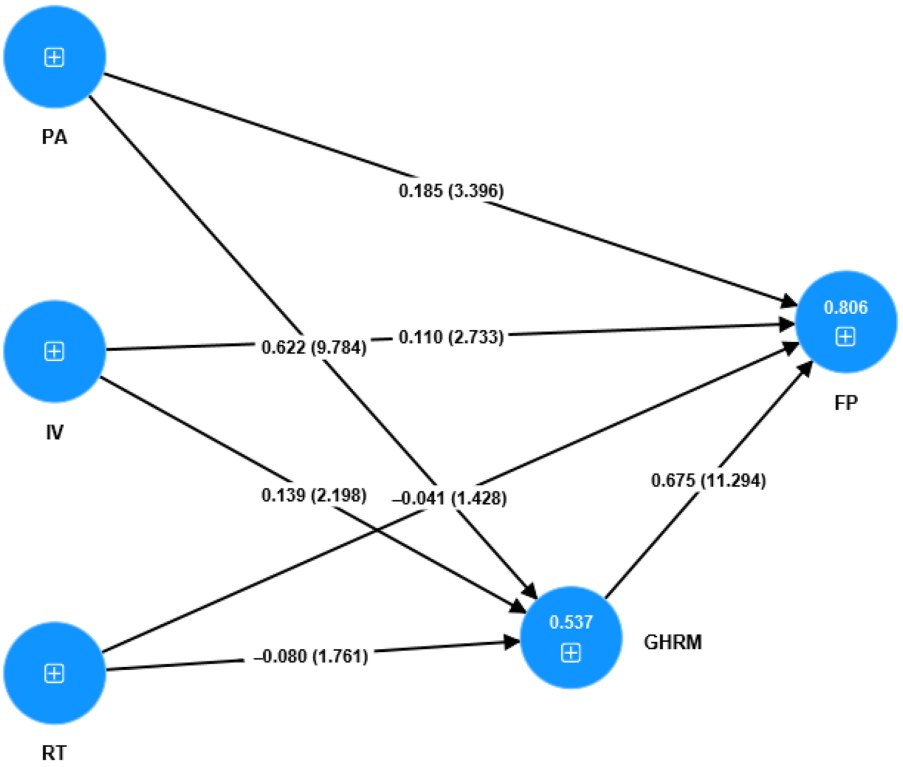

Figure 3. Structural model. Source: Estimated by the researchers

Table 6. SEM estimations [indirect paths]

H.No.	Proposed paths	Std. (β)	Mean	Std. Dev	*t*-value	*p*-value	BCI LL	BCI UL	f^2	Decision
H5	RT → GHRM → FP	−0.054	−0.054	0.03	1.79	0.073	−0.114	0.005	0.0029	No
H6	IV→ GHRM → FP	0.094	0.095	0.044	2.141	0.032	0.011	0.183	0.1088	Yes
H7	PA → GHRM→ FP	0.420	0.421	0.059	7.081	0.000	0.312	0.544	0.1764	Yes

Note(s): Effect size = F2 [none = 00; small = 0.02; medium = 0.15; large = 0.35]; $p < 0.5$; BCI LL = the bias-corrected confidence interval lower limit; BCI UL = the bias-corrected confidence interval of upper limit
Source(s): Estimated by the researchers

6. Discussion and conclusion

This study considered the effect of CE (RT, IV, and PA) on GHRM and FP in manufacturing firms in Egypt. The outcomes show a negative impact of RT on both GHRM and FP, which is not supported by the literature (Florén *et al.*, 2016; Baldegger *et al.*, 2020; Salehe *et al.*, 2024; Al-Najjar *et al.*, 2024; Correia *et al.*, 2024). These adverse connections likely arise from the misalignment between short-term, high-risk strategies and the long-term, sustainability-

focused goals of GHRM. When organizations prioritize risky ventures that emphasize quick returns, they may divert resources and attention away from GHRM practices, such as environmental management training and encouraging eco-friendly behaviour.

Contextually, the negative results may exist due to cultural barriers in Egypt, which are often accompanied by alarm and suspicion. These cultural barriers and assumptions of RT may discourage proactive or experimental approaches, further reducing the potential of manufacturing firms to achieve desired performance and implement GHRM practices. The political instability, cultural risk aversion, or institutional instability in Egypt may hinder the firm's performance because they affect the development of effective policies and strategies, which can lead to risk-oriented strategies and impede sustainable performance gains. As a consequence, firms may struggle to understand the expected benefits of RT in such an uncertain and risk-averse context.

The study confirmed a positive effect of IV on FP and GHRM. These results are in line with domain literature like Yousaf *et al.* (2020), Ali *et al.* (2021), Çağlıyan *et al.* (2022), Abd-elmonem *et al.* (2022), Hurtado-Palomino *et al.* (2024), Suleman *et al.* (2024), Zhou *et al.* (2024) and Reyes-Gómez *et al.* (2025), who suggest the positive associations between these constructs. These results demonstrate that novel and new ideas reinforce FP. The generation of new ideas and notions offers a significant environment for HRM practices that take care of the environment. This also enhances market competition by creating demand among customers and improves the firm's vision and strategies to boost efficiency and customer satisfaction, which further enhances overall FP.

Similarly, the path analysis confirmed a positive effect of PA on FP and GHRM. These results are in line with domain literature (Haijian and Chuanming, 2009; Bature *et al.*, 2018; Yang and Meyer, 2019; Naseer *et al.*, 2021; Kiss *et al.*, 2022; Patwary *et al.*, 2023; Dost and Umrani, 2024; Hurtado-Palomino *et al.*, 2024). The positive effects in this study reflect how PA enables Egyptian manufacturing firms to stay ahead of the curve in both market trends and sustainability initiatives. Firms with a greater ability to identify new opportunities are better positioned to incorporate green practices into their operations, making them leaders in environmental responsibility and innovation.

Moreover, the study confirmed a positive effect of GHRM on FP, which is in line with several studies (Jirawuttinunt and Limsuwan, 2019; Jayabalan *et al.*, 2020; Almeer and Almaamari, 2022; Awwad Al-Shammari *et al.*, 2022; Carballo-Penela *et al.*, 2023; Setyaningrum and Muafi, 2023; Mahmood *et al.*, 2023; Chau *et al.*, 2024; Altassan, 2024). These results suggest that GHRM impacts FP by assimilating environmental sustainability into HR practices, enhancing job satisfaction, innovation, and operational efficiency. Suitable training in environmental management equips employees to contribute to sustainable product development and improve product quality, driving sales growth and market share. Encouraging employees to advise environmental improvements nurtures a culture of improvement, leading to the expansion of new products and services, and eventually enhancing overall FP.

Finally, the mediating analysis confirmed a mediating role of GHRM in developing the association between IV, PA, and FP, except for RT and FP. These associations are in accordance and contradiction with several studies (Úbeda-García *et al.*, 2021; Ahmed *et al.*, 2023; Islam *et al.*, 2021; Ngo and Ngo, 2023; Hurtado-Palomino *et al.*, 2024; Bosompem *et al.*, 2024; Altassan, 2024; Zhou *et al.*, 2024; Reyes-Gómez *et al.*, 2025). Our results prove that GHRM hugely enhances FP, both directly and indirectly, helping to develop the connection between IV, PA, and FP. On the other hand, it does not create any connection between RT and FP.

To sum up, the study's overall findings suggest a negative effect of RT on FP and GHRM, while the effect of IV and PA on FP and GHRM is found to be positive. Besides, GHRM is also a positive predictor of FP. Regarding indirect effects, the analysis indicates that GHRM mediates the relationships between the IV, PA, and FP but does not mediate the relationship between RT and FP in the context of Egyptian manufacturing firms.

7. Implications, limitations and future research avenues

With regard to practical implications, this study assists management and top leadership in firms in decreasing the risk factor to enhance overall performance. The study provides guidelines for managers and decision-makers to balance return on investment (ROI) and financial stability in order to achieve sustainable development of the firm. In light of the study's outcomes, organizations may develop a culture of IV and PA to enhance FP, along with a better reputation and market standing. Organizations should ensure that GHRM protects the environment and achieves sustainability in order to drive motivation, productivity, and profitability. The mediation confirmation of GHRM would assist firms in prioritizing GHRM practices, which can better translate their IV and PA efforts into improved performance outcomes, likely due to the alignment of environmental sustainability with IV and PA strategies. Henceforth, firms should focus on integrating GHRM with IV and PA strategies to maximize performance benefits but may need to explore different approaches to mitigate the risks associated with RT behaviours.

The theoretical implications of the study need to be refined the model in further investigations due to the existence of a few negative connections. The present study opens new avenues for understanding the links between RT and FP, as the traditional theories demonstrate that RT is essential for innovation and growth. In addition, the positive connection between CE (PA and IV) and FP further encourages the pursuit of a competitive advantage between firms. The connection between CE and GHRM aligns with institutional and stakeholder theories, where environmental norms fulfil the expectations of firms regarding performance and profitability. Besides, the present study validates the relevance of the RBV theory in Egyptian manufacturing firms, enriching the literature with empirical evidence from a developing context. This suggests that firms can achieve a competitive advantage by applying unique resources and contributes to the theory of corporate sustainability by highlighting the role of HRM in implanting environmental values within organizational culture. Finally, the study contributes to the domain literature from an empirical stance of a developing context where manufacturing firms are focused.

The study contains several limitations, as it is conducted in a developing country. The study was based on only quantitative methods, where cross-sectional data were gathered to infer the results. The theoretical framework of the study is based on a few constructs, such as CE (RT, IV, and PA), GHRM and FP, where only direct and indirect paths are explored. Contextually, the study is restricted to manufacturing firms in Egypt, where only top executives and firms' human resource directors are targeted as suitable study respondents on a convenience basis. The study did not compare the contextually grounded approach by incorporating institutional and cultural dimensions. Finally, the results of the study are based on only 308 cases.

In future studies, other methods, such as mixed and qualitative methods, should be applied to bring diversity. Besides, longitudinal data should be collected and utilized to get more authentic and valid results. Other constructs such as green culture, green values, environmental awareness, green HRM practices, employees' commitment, entrepreneurial attitudes and intentions, employees' satisfaction, and pro-environmental behaviours, must be added as direct mediators and moderators to predict the GHRM and FP within the firms. Future studies could adopt a comparative or contextually grounded approach by incorporating institutional and cultural dimensions. Finally, the coming studies should increase the sample size to ensure better generalization of the results.

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